DEC 2 2 1999

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ENVIRONMENTAL COMPLIANCE SERVICES, INC.

December 17, 1999
Project #40170.10
Document: Site_inv.doc

Mr. Chuck Schwer, Supervisor
Sites Management Section
VT DEC Waste Management Division
103 South Main Street
Waterbury, VT 05671-0404

RE: Site Investigation Report
Whitingham Country Store, Route 100, Whitingham, VT
SMS Site #99-2613

Dear Mr. Schwer:

Enclosed please find the above-referenced report for your review. If you have any questions or require further information, please call me at 802-257-1195.

Sincerely,
ENVIRONMENTAL COMPLIANCE SERVICES, INC.

David C. Balk

David C. Balk, P.G.
Project Manager

enclosure

cc: Lee Merrill, Barrows Coal Company

588 Silver Street • Agawam, MA 01001 • 413-789-3530 • Fax 413-789-2776
157 Old Guilford Road #6 • Brattleboro, VT 05301 • 802-257-1195 • Fax 802-257-1603
18 Shepherd Street • Brighton, MA 02135 • 617-782-4417 • Fax 617-254-5939
2119 West Brandon Blvd., Suite K • Brandon, FL 33511 • 813-643-8887 • Fax 813-643-3847

DEC 2 2 1999

Phase	Type
X Initial Site Investigation ☐ Corrective Action Feasibility Investigation ☐ Corrective Action Plan ☐ Corrective Action Summary Report ☐ Operations and Monitoring Report	☐ Work Scope **X Technical Report** ☐ PCF Reimbursement Request ☐ General Correspondence

Site Investigation Report
Whitingham Country Store
Route 100
Whitingham, Vermont
SMS Site #99-2613

Prepared for:

Barrows Coal Company
35 Main Street
Brattleboro, Vermont 05301
Contact: Lee Merrill
Phone: (802) 254-4574

Prepared by:

Environmental Compliance Services, Inc.
157 Old Guilford Road #6
Brattleboro, VT 05301
Contact: David C. Balk, P.G.
Phone: (802) 257-1195

Project No.: 40170.10

December 17, 1999

Site Investigation Report
Whitingham Country Store, Whitingham
Site #99-2613

TABLE OF CONTENTS

1.0 Introduction

Two 1,000 gallon gasoline underground storage tanks (USTs) were removed on April 22, 1999 at Whitingham Country Store ("the site;" see locus map, Appendix A) by Barrows Coal Company. Soils from the tank graves and associated piping excavation were screened with a Photovac Model 2020 photoionization detector (PID) for the presence of Volatile Organic Compound (VOC) concentrations. The levels of contamination ranged from 10 to 700 parts per million (ppm). A tank closure report was submitted by Environmental Compliance Services, Inc. (ECS) of Brattleboro, VT to the VT DEC who requested subsurface investigations to assess the extent and degree of petroleum contamination in soil and/or groundwater at the site.

ECS submitted a work plan for these additional investigations to the VT DEC on behalf of Barrows Coal Company. The work plan included soil boring advancement, groundwater monitoring well installation, groundwater sampling and analysis, and a sensitive receptor survey. The work plan was approved by the Sites Management Section (SMS) on July 21, 1999.

This report documents the work performed by ECS at the site and presents results, conclusions and recommendations.

2.0 Site Description

The subject property exists at an elevation of approximately 1,594 feet above mean sea level. The Whitingham Country Store site has one building occupied by the U.S. Post Office, a general store, and numerous apartments. The site is surrounded by residential property. To the north is Route 100 with residential property beyond that. Residences exist south and west of the site. To the east is Stimpson Hill Road with a church and town historical museum beyond that. Drinking water is supplied by an onsite drinking water well located approximately 200 feet south of the tank grave.

Observations made during the tank removal in April 1999 indicate that the soils consist of brown silt and fine grained sand with large bolders to 10 feet below ground surface (bgs). Groundwater was encountered at 7 feet bgs in the tank grave.

3.0 Work Performed

3.1 Soil Borings and Monitoring Wells

A hollow stem auger mobile drill rig was used by ECS to install four monitoring wells on September 28, 1999. The wells were designated ECS-1, ECS-2, ECS-3, and ECS-4. The well depths ranged from 8.5- 10 feet deep, and constructed of 2 inch diameter schedule 40 PVC slotted screen (size 10) with flush mounted road boxes. Monitoring well construction logs are presented in Appendix B.

3.2 Field Screening of Soil Samples

During drilling, split-spoon soil samples were obtained at the surface and five-foot intervals there after from each of the boreholes. The samples were field screened for VOCs with a Photovac Model photoionization detector (PID), using bag headspace protocol. VOC levels ranging from 3 to 442 ppmv were detected in the split spoon soil samples. The highest readings were detected in boring ECS-3 located downgradient of the tank grave.

3.3 Groundwater Gauging and Sampling

Groundwater gauging and sampling was performed by ECS personnel on October 6, 1999. Depth to groundwater in each well was measured with a Slope electronic water level indicator from the top of the PVC well heads. The instrument is accurate to 0.01 foot.

Groundwater samples were obtained with disposable plastic bailers after three well volumes of groundwater were evacuated from each well. A duplicate groundwater sample from ECS-3 and a trip blank were obtained for quality control purposes. All samples were stored on ice immediately upon collection, and refrigerated until delivery was made to Spectrum Analytical, Inc. in Agawam, Massachusetts for analysis of VOCs by EPA Method 8021B.

3.4 Drinking Water Sample

The onsite drilled private water supply well was installed to the depth of 147 bgs on August 27, 1993. A log for the drilled well indicated bedrock was encountered at 25 feet bgs with casing installed approximately 63 feet bgs. A water sample was collected from the sink in the general store and submitted to Spectrum Analytical, Inc. for analysis of VOCs by EPA Method 8021B and Total Petroleum Hydrocarbons (TPH) by EPA Method 8015M.

4.0 Results

4.1 Groundwater Potentiometric Data

Data from the October 6, 1999 gauging of groundwater levels are presented in Table 1. Depth to groundwater ranged from 1.66 feet in ECS-3 to 4.20 feet in ECS-1.

Table 1. Groundwater potentiometric data.

Date	ECS-1	ECS-2	ECS-3	ECS-4
PVC elevation	*99.86*	*97.20*	*92.80*	*92.43*
10/6/99	95.66	93.92	91.14	89.97
Elevations measured in feet from an arbitrary datum.				

A groundwater potentiometric surface map is presented in Appendix C. The map shows that groundwater flows in a southwesterly direction towards Harriman Reservoir located approximately 2,000 feet downgradient of the site.

4.2 Laboratory Analysis of Groundwater and Drinking Water Samples

The groundwater samples obtained on October 6, 1999 were analyzed for VOCs by EPA Method 8021B. The onsite water supply well sample was analyzed for VOCs via EPA Method 8021B, and TPH via Method 8100M. Results are presented in Table 2, which includes Primary Groundwater Quality Standards (PGQS) for reference. A contaminant isoconcentration map was created from the results presented in Table 2 and is presented in Appendix D. The complete laboratory data sheets and chain of custody record are presented in Appendix E.

Table 2. Analytical Results of Groundwater and Drinking Water Samples.

Date	Compound	PGQS	ECS-1	ECS-2	ECS-3		ECS-4	DW
10/6/99	Benzene	5.0	ND	**67**	17	19	ND	ND
	Toluene	1,000	ND	32	59	31	ND	ND
	Ethylbenzene	700	ND	34	85	59	ND	ND
	Xylenes	10,000	ND	45	414	246	ND	ND
	Total BTEX		ND	178	575	355	ND	ND
	Naphthalene	20	ND	14	**35**	**25**	ND	ND
	1,2,4-Trimethylbenzene	5.0	ND	**12**	**190**	**100**	ND	ND
	1,3,5-Trimethylbenzene	4.0	ND	**5.6**	**57**	**35**	ND	ND
	MTBE	40	ND	**200**	**280**	**290**	ND	ND
	TPH		NS	NS	NS	NS	NS	ND

Results reported in ug/L (ppb), except TPH which are in mg/l (ppm)
ND = Not detected.
NS = Not sampled
DW = Drinking water
Split cells indicate duplicate analyses.
Boldface type indicates PGQS exceedances.

5.0 Risk Evaluation

5.1 Potential Sources

Benzene, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, and MTBE were detected in groundwater above PGQS standards for samples collected from monitoring wells ECS-2 and ECS-3. Additionally, the Naphthalene level exceeded PGQS standards in monitoring well ECS-3. This groundwater contamination can be attributed to the tanks and piping which were removed and replaced in April 1999, when elevated VOC levels were detected with a PID in soil around the piping and tanks.

5.2 Potential Receptors

The potential sensitive receptors of most immediate concern are occupants of the site. The water supply well is located 200 feet south of from the tank graves. Monitoring well ECS-4 placed between the tank grave and the water supply well yielded no detectable contaminants. Indoor air in the building was screened for VOCs with a PID, and none were detected above the MDL of 0.1 ppmv.

The closest off-site residential properties are located downgradient approximately 200 feet. There are numerous water supplies known to be located within a ½ mile radius of the site.

Harriman Reservoir and the outlet stream to Sadawga Lake are the nearest potential sensitive environmental receptors. No evidence of sheen or odors was observed in the Sadawga Lake outlet stream, which leads to Harriman Reservoir.

6.0 Conclusions and Recommendations

6.1 Conclusions

ECS presents the following conclusions based on the information obtained at the site to date:

- Groundwater flow direction was shown to be in a southwesterly direction. Depth to groundwater at the tank grave is approximately 3 feet.
- Benzene, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Naphthalene, and MTBE levels were detected at concentrations greater than PGQS at wells near and downgradient of the former UST system. No compounds tested for were detected in the on-site drinking water well or the upgradient monitoring well. No contaminants were detected at ECS-4, the monitoring well located between the tank graves and the drinking water supply well.
- No VOCs were detected in the indoor air of the site building, the nearest occupied structure to the former USTs and pump island.
- Based on observations during the tank closure at the site, the probable source of the release, piping associated with the USTs. The piping and tanks have been removed from the site and no new USTs have been installed.

6.2 Recommendations

ECS recommends that three additional monitoring wells be installed downgradient of the furthest impacted well ECS-3 on the neighboring property to further define the extent of contamination at this site. The indoor air of the unoccupied residence should be screened for VOCs by PID during the monitoring well installation. The proposed monitoring wells and the existing monitoring wells should be sampled for VOCs via EPA Method 8021B.

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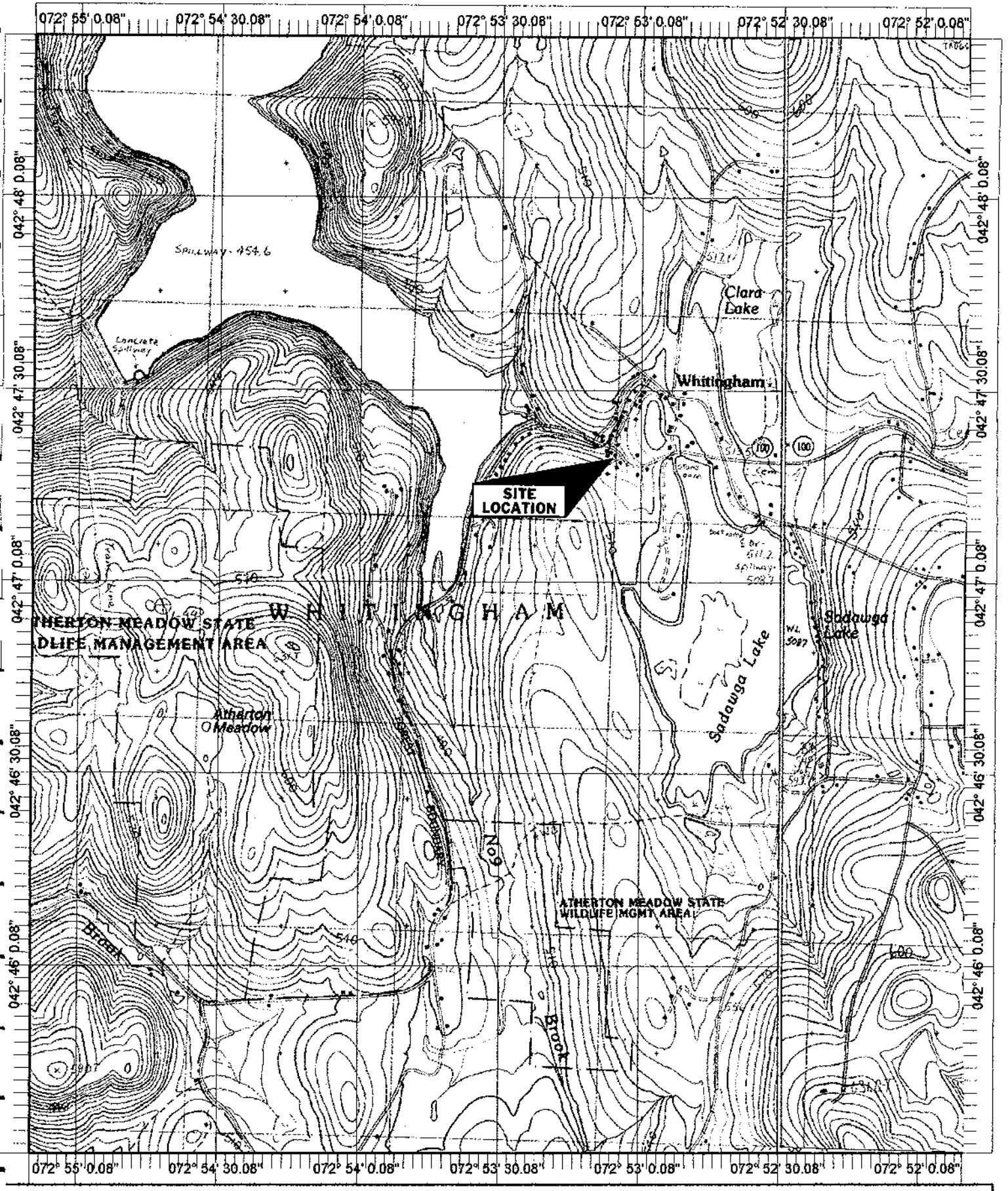
Appendix A

Site Locus Map



Name: READSBORO
Date: 11/12/99
Scale: 1 inch equals 2000 feet

Location: 042° 46' 57.8" N 072° 53' 30.3" W
Caption: Whitingham Country Store
Route 100
Whitingham, VT 05361

Appendix B

Soil Boring/Monitoring Well Construction Logs

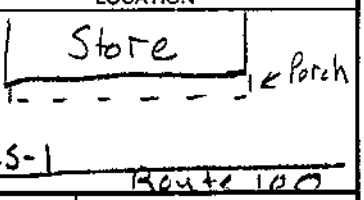
Environmental Compliance Services, Inc.
157 Old Guilford Rd. ,#6,Brattleboro, Vermont 05301

SOIL BORING and MONITORING WELL INSTALLATION LOG

BORING NO.:	ECS-1
DOCUMENT NO.:	
SHEET	1 OF 1

BORING COMPANY	Environmental Compliance Services, Inc.	JOB NUMBER:	40170.10
BORING COMPANY ADDRESS:	588 Silver Street, Agawam, Massachusetts	PROJECT NAME:	Whitingham Country Store
FOREMAN:	S. Werbicki	PROJECT ADDRESS:	Route 100 Whitingham, VT
ECS INSPECTOR:	J. Prior	CLIENT NAME:	Barrows

LOCATION



GROUNDWATER OBSERVATIONS				CASING	SAMPLER	CORE BARREL
Date	Depth	Stabilization Time	TYPE	Hollow Stem Auger	Split Spoon	
			INSIDE DIAMETER	4.25"	1 3/8"	
			HAMMER WEIGHT		140 lbs	
			HAMMER FALL		30"	
			NOTES:			

Casing Elevation (ft.)	
PVC Elevation (ft.)	
Surface Elevation (ft.)	
Date Started	9/28/99
Date Completed	9/28/99

Depth	Sample Number	Sample Depths	Penetration/ Recovery	Blows per 6" penetration	Strata Changes	Soil Descriptions	Well As Built	Field Testing [1]	Notes
0		0 - 2		off flights		f-m brown SAND Dry		36	
					f-m SAND and CLAY				
5		5 - 7	24/6"	4-4-6-8		m. brown SAND gray CLAY in tip, moist, trace gravel		10.5	2
					7'				
10		10 - 12		off lead auger	f. SAND	f. brown SAND wet		3.8	
					10'				3
					End of Boring	Refusal at 10'			

1. Field testing values represent total volatile organic vapors (referenced to a benzene standard) measured in the headspace of sealed soil sample jars or Zip-lock ™ bags, with a Photovac Model 2020 photoionization detector (PID). Results reported in parts per million by volume (ppmv). Detection limit calibrated to 0.2 ppmv.
2. Groundwater encountered at approximately 7'-10' below grade.
3. Well completion record 10' = Total Depth 8'= 2" PVC screen 2'=2" PVC riser

10' to 2' - SAND 2' to 1'- Bentonite 1' to 0' - native concreted 6" flush mount road box

Environmental Compliance Services, Inc.
157 Old Guilford Rd. #6, Brattleboro, Vermont 05301

SOIL BORING and MONITORING WELL INSTALLATION LOG

BORING NO.:	ECS-2
DOCUMENT NO.:	
SHEET	1 OF 1

LOCATION

store // Slope //
Route 100
ECS-2

BORING COMPANY	Environmental Compliance Services, Inc.	JOB NUMBER:	40170.10
BORING COMPANY ADDRESS:	588 Silver Street, Agawam, Massachusetts	PROJECT NAME:	Whitingham Country Store
FOREMAN:	S. Werbicki	PROJECT ADDRESS:	Route 100 Whitingham, VT
ECS INSPECTOR:	J. Prior	CLIENT NAME:	Barrows

GROUNDWATER OBSERVATIONS				CASING	SAMPLER	CORE BARREL
Date	Depth	Stabilization Time	TYPE	Hollow Stem Auger	Split Spoon	
			INSIDE DIAMETER	4.25"	1 3/8"	
			HAMMER WEIGHT		140 lbs	
			HAMMER FALL		30"	
			NOTES:			

Casing Elevation (ft.)	
PVC Elevation (ft.)	
Surface Elevation (ft.)	
Date Started	9/28/99
Date Completed	9/28/99

Depth	Sample Number	Sample Depths	Penetration/ Recovery	Blows per 6" penetration	Strata Changes	Soil Descriptions	Well As Built	Field Testing (1)	Notes
0		0 - 2		off flights		f. dark brown SAND moist		3.8	
					f. SAND				
5		5 - 7	24/12"	5-6-17-17		f. brown SAND wet		77	2
					7'				
10		10 - 12	24/6"	16-17-39-50/0"	f-m SAND	f-m brown SAND trace cobbles, wet, odors		2.6	
					12'				3
					End of Boring	Refusal at 12'			

1. Field testing values represent total volatile organic vapors (referenced to a benzene standard) measured in the headspace of sealed soil sample jars or Zip-lock ™ bags, with a Photovac Model 2020 photolonization detector (PID). Results reported in parts per million by volume (ppmv). Detection limit calibrated to 0.2 ppmv.

2. Groundwater encountered at approximately 5'-7' below grade.

3. Well completion record 10' = Total Depth 8'= 2" PVC screen 2'=2" PVC riser

10' to 2' - SAND 2' to 1'- Bentonite 1' to 0' - native concreted 6" flush mount road box

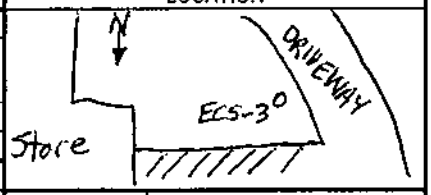
Environmental Compliance Services, Inc.
157 Old Guilford Rd. ,#6,Brattleboro, Vermont 05301

SOIL BORING and MONITORING WELL INSTALLATION LOG

BORING NO.:	ECS-3
DOCUMENT NO.:	
SHEET	1 OF 1

BORING COMPANY	Environmental Compliance Services, Inc.	JOB NUMBER:	40170.10
BORING COMPANY ADDRESS:	588 Silver Street, Agawam, Massachusetts	PROJECT NAME:	Whitingham Country Store
FOREMAN:	S. Werbicki	PROJECT ADDRESS:	Route 100 Whitingham, VT
ECS INSPECTOR:	J. Prior	CLIENT NAME:	Barrows

LOCATION



GROUNDWATER OBSERVATIONS				CASING	SAMPLER	CORE BARREL
Date	Depth	Stabilization Time	TYPE	Hollow Stem Auger	Split Spoon	
			INSIDE DIAMETER	4.25"	1 3/8"	
			HAMMER WEIGHT		140 lbs	
			HAMMER FALL		30"	
			NOTES:			

Casing Elevation (ft.)	
PVC Elevation (ft.)	
Surface Elevation (ft.)	
Date Started	9/28/99
Date Completed	9/28/99

Depth	Sample Number	Sample Depths	Penetration/ Recovery	Blows per 6" penetration	Strata Changes	Soil Descriptions	Well As Built	Field Testing [1]	Notes
0		0 - 2		off flights		f. dark brown SAND some SILT, moist		12.2	
					f. SAND				
					5'				
5		5 - 7	24/24"	16-23-24-23		f-m brown SAND, some black SAND, odors, moist		89	2
					f-m SAND				
10		10 - 12		off lead auger		f-m brown SAND, wet, trace silt, odors		442	
					9'				3
					End of Boring	Refusal at 9'			

1. Field testing values represent total volatile organic vapors (referenced to a benzene standard) measured in the headspace of sealed soil sample jars or Zip-lock ™ bags, with a Photovac Model 2020 photolonization detector (PID). Results reported in parts per million by volume (ppmv). Detection limit calibrated to 0.2 ppmv.

2. Groundwater encountered at approximately 5'-7' below grade.

3. Well completion record 9' = Total Depth 7'= 2" PVC screen 2'=2" PVC riser

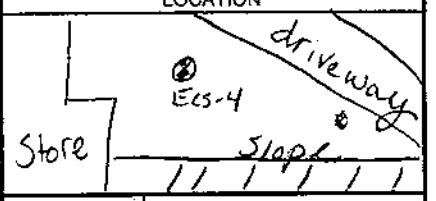
9' to 2' - SAND 2' to 1'- Bentonite 1' to 0' - native concreted 6" flush mount road box

Environmental Compliance Services, Inc.
157 Old Guilford Rd., #6, Brattleboro, Vermont 05301

SOIL BORING and MONITORING WELL INSTALLATION LOG

BORING NO.:	ECS-4
DOCUMENT NO.:	
SHEET	1 OF 1

LOCATION



BORING COMPANY	Environmental Compliance Services, Inc.	JOB NUMBER:	40170.10
BORING COMPANY ADDRESS:	588 Silver Street, Agawam, Massachusetts	PROJECT NAME:	
FOREMAN:	S. Werbicki	PROJECT ADDRESS:	Route 100 Whitingham, VT
ECS INSPECTOR:	J. Prior	CLIENT NAME:	Barrows

GROUNDWATER OBSERVATIONS				CASING	SAMPLER	CORE BARREL
Date	Depth	Stabilization Time	TYPE	Hollow Stem Auger	Split Spoon	
			INSIDE DIAMETER	4.25"	1 3/8"	
			HAMMER WEIGHT		140 lbs	
			HAMMER FALL		30"	
			NOTES:			

Casing Elevation (ft.)	
PVC Elevation (ft.)	
Surface Elevation (ft.)	
Date Started	9/28/99
Date Completed	9/28/99

Depth	Sample Number	Sample Depths	Penetration/ Recovery	Blows per 6" penetration	Strata Changes	Soil Descriptions	Well As Built	Field Testing [1]	Notes
0		0 - 2		off flights		f. dark brown SAND and SILT, moist		10.3	
					f. SAND				
					5'				
5		5 - 7	24/12"	9-25-20-24		m-c gray SAND, trace f. Sand, wet		3.7	2
					m-c SAND				
					7'				
10		10 - 12		off lead auger		f. brown and green SAND, wet		40	
					f. SAND				
					9'				3
					End of Boring	Refusal at 9'			

1. Field testing values represent total volatile organic vapors (referenced to a benzene standard) measured in the headspace of sealed soil sample jars or Zip-lock ™ bags, with a Photovac Model 2020 photolonization detector (PID). Results reported in parts per million by volume (ppmv). Detection limit calibrated to 0.2 ppmv.
2. Groundwater encountered at approximately 5' below grade.
3. Well completion record 8.5' = Total Depth 7'= 2" PVC screen 1.5'=2" PVC riser

9' to 2' - SAND 2' to 1'- Bentonite 1' to 0' - native concreted 6" flush mount road box

Appendix C

Groundwater Potentiometric Surface Map

Appendix D

Contaminant Isoconcentration Map

Appendix E

Laboratory Data Sheets and Chain of Custody Record

SPECTRUM ANALYTICAL, INC.

Massachusetts Certification M-MA 138
Connecticut Approval # PH 0777
Rhode Island # 98 & Maine # n/a
New Hampshire ID # 2538
New York ID #11393
Florida HRS87448

ECS, Inc.
157 Old Guilford Road, #6
Brattleboro, VT 05301

October 22, 1999

Attn: David Balk

Client Project No.: **40170.10** Location: **Whitingham Country Store-VT**

Lab ID No.	Client ID	Analysis Requested
AB59957	ECS-1	EPA Method 8021B
AB59958	ECS-2	EPA Method 8021B
AB59959	ECS-3	EPA Method 8021B
AB59960	ECS-4	EPA Method 8021B
AB59961	DW	EPA Method 8021B TPH Modified SW846 8015
AB59962	DUP	EPA Method 8021B
AB59963	TRIP	EPA Method 8021B

Authorized by

Hanibal Tayeh
President/Laboratory Director

SPECTRUM ANALYTICAL, INC.

Laboratory Report

Client ID: **ECS-1**
Lab ID No: **AB59957**

Location: **Whitingham Country Store-VT**
Client Job No: **40170.10**

Matrix: **Ground Water**
Sampled on10/06/99 Client ECS
Received on 10/07/99 by KC
QC and Data Review by DDR

Preservative: Refrigeration, HCl
Container: 2 VOA Vials
Condition of Sample as Received: Satisfactory
Delivered by: Courier

Volatile Organics

SW846 Method 8021B

Parameter for AB59957	Result (in ug/L)	MDL	Analyzed	Analyst
Benzene	Not detected	1.0	10/19/99	DG
Toluene	Not detected	1.0	10/19/99	DG
Ethylbenzene	Not detected	1.0	10/19/99	DG
m,p-Xylenes	Not detected	2.0	10/19/99	DG
o-Xylene	Not detected	1.0	10/19/99	DG
Naphthalene	Not detected	1.0	10/19/99	DG
1,2,4-Trimethylbenzene	Not detected	1.0	10/19/99	DG
1,3,5-Trimethylbenzene	Not detected	1.0	10/19/99	DG
Methyl-t-butyl ether	Not detected	1.0	10/19/99	DG
Bromofluorobenzene (%SR)	120		10/19/99	DG

SPECTRUM ANALYTICAL, INC.

Laboratory Report

Client ID: **ECS-2**
Lab ID No: **AB59958**

Location: **Whitingham Country Store-VT**
Client Job No: **40170.10**

Matrix: **Ground Water**
Sampled on10/06/99 Client ECS
Received on 10/07/99 by KC
QC and Data Review by DDR

Preservative: Refrigeration, HCl
Container: 2 VOA Vials
Condition of Sample as Received: Satisfactory
Delivered by: Courier

Volatile Organics

SW846 Method 8021B

Parameter for AB59958	Result (in ug/L)	MDL	Analyzed	Analyst
Benzene	67	2.5	10/19/99	DG
Toluene	32	2.5	10/19/99	DG
Ethylbenzene	34	2.5	10/19/99	DG
m,p-Xylenes	42	5.0	10/19/99	DG
o-Xylene	3.0	2.5	10/19/99	DG
Naphthalene	14	2.5	10/19/99	DG
1,2,4-Trimethylbenzene	12	2.5	10/19/99	DG
1,3,5-Trimethylbenzene	5.6	2.5	10/19/99	DG
Methyl-t-butyl ether	200	2.5	10/19/99	DG
Bromofluorobenzene (%SR)	115		10/19/99	DG

SPECTRUM ANALYTICAL, INC.

Laboratory Report

Client ID: **ECS-3**
Lab ID No: **AB59959**

Location: **Whitingham Country Store-VT**
Client Job No: **40170.10**

Matrix: **Ground Water**
Sampled on10/06/99 Client ECS
Received on 10/07/99 by KC
QC and Data Review by DDR

Preservative: Refrigeration, HCl
Container: 2 VOA Vials
Condition of Sample as Received: Satisfactory
Delivered by: Courier

Volatile Organics

SW846 Method 8021B

Parameter for AB59959	Result (in ug/L)	MDL	Analyzed	Analyst
Benzene	17	5.0	10/19/99	DG
Toluene	59	5.0	10/19/99	DG
Ethylbenzene	85	5.0	10/19/99	DG
m,p-Xylenes	320	10.0	10/19/99	DG
o-Xylene	94	5.0	10/19/99	DG
Naphthalene	35	5.0	10/19/99	DG
1,2,4-Trimethylbenzene	190	5.0	10/19/99	DG
1,3,5-Trimethylbenzene	57	5.0	10/19/99	DG
Methyl-t-butyl ether	280	5.0	10/19/99	DG
Bromofluorobenzene (%SR)	114		10/19/99	DG

SPECTRUM ANALYTICAL, INC.

Laboratory Report

Client ID: **ECS-4**
Lab ID No: **AB59960**

Location: **Whitingham Country Store-VT**
Client Job No: **40170.10**

Matrix: **Ground Water**
Sampled on10/06/99 Client ECS
Received on 10/07/99 by KC
QC and Data Review by

Preservative: Refrigeration, HCl
Container: 2 VOA Vials
Condition of Sample as Received: Satisfactory
Delivered by: Courier

Volatile Organics

SW846 Method 8021B

Parameter for AB59960	**Result** (in ug/L)	**MDL**	**Analyzed**	**Analyst**
Benzene	Not detected	2.0	10/20/99	DG
Toluene	Not detected	2.0	10/20/99	DG
Ethylbenzene	Not detected	2.0	10/20/99	DG
m,p-Xylenes	Not detected	4.0	10/20/99	DG
o-Xylene	Not detected	2.0	10/20/99	DG
Naphthalene	Not detected	2.0	10/20/99	DG
1,2,4-Trimethylbenzene	Not detected	2.0	10/20/99	DG
1,3,5-Trimethylbenzene	Not detected	2.0	10/20/99	DG
Methyl-t-butyl ether	Not detected	2.0	10/20/99	DG
Bromofluorobenzene (%SR)	93		10/20/99	DG

SPECTRUM ANALYTICAL, INC.

Laboratory Report

Client ID: **DW**
Lab ID No: **AB59961**

Location: **Whitingham Country Store-VT**
Client Job No: **40170.10**

Matrix: Drinking Water
Collected: 10/06/99 by ECS
Received on 10/07/99 by KC
QC and Data Review by

Preservative: Refrigeration
Container: 1 Amber Glass
Condition of Sample as Received: Satisfactory
Delivered by: Courier

Total Petroleum Hydrocarbons by GC

Modified EPA Method 8015

Parameter	Result (mg/L)	MDL	Extracted	Analyzed	Analyst
Total Hydrocarbons	Not detected		10/18/99	10/20/99	MBL
Fuel Oil #2	Not detected	0.3	10/18/99	10/20/99	MBL
Fuel Oil #4	Not detected	0.3	10/18/99	10/20/99	MBL
Fuel Oil #6	Not detected	0.7	10/18/99	10/20/99	MBL
Motor Oil	Not detected	0.5	10/18/99	10/20/99	MBL
Ligroin	Not detected	0.3	10/18/99	10/20/99	MBL
Aviation Fuel	Not detected	0.3	10/18/99	10/20/99	MBL
Unidentified	Not detected		10/18/99	10/20/99	MBL
Gasoline	Not detected	0.2	10/18/99	10/20/99	MBL
Other	Not detected	0.5	10/18/99	10/20/99	MBL

Petroleum identification is determined by comparing the GC fingerprint obtained from the sample with a library of GC fingerprints obtained from petroleum products. Possible match categories are as follows;

Gasoline - includes regular, unleaded, premium, etc.
Fuel Oil #2 - includes home heating oil, #2 fuel oil and diesel.
Fuel Oil #4 - Includes #4 Fuel Oil
Fuel Oil #6 - includes #6 oil and bunker "C" oil.
Motor Oil - includes virgin and waste automobile oils.
Ligroin - includes mineral spirits, petroleum naphtha, vm&p naphtha.
Aviation Fuels - includes Kerosene, Jet A and JP-4.
Other Oil - includes cutting and lubricating oils.

Factors such as microbial degradation, weathering and solubility generally prevent specific identification within a petroleum category. A finding of "unidentified" means that the sample fingerprint was characteristic of a petroleum product, but could not be matched to a fingerprint in the library.

After fingerprint identification, the amount present in the sample is quantified using a calibration curve prepared from a petroleum product of the same category as the identified petroleum. Unidentified petroleum is quantified using a petroleum calibration that approximates the distribution of compounds in the sample. A * in the results column indicates the petroleum calibration used to quantify unidentified samples.

SPECTRUM ANALYTICAL, INC.

Laboratory Report

Client ID: **DW**
Lab ID No: **AB59961**

Location: **Whitingham Country Store-VT**
Client Job No: **40170.10**

Matrix: **Drinking Water**
Sampled on10/06/99 Client ECS
Received on 10/07/99 by KC
QC and Data Review by

Preservative: Refrigeration, HCl
Container: 2 VOA Vials
Condition of Sample as Received: Satisfactory
Delivered by: Courier

Volatile Organics

SW846 Method 8021B

Parameter for AB59961	**Result** (in ug/L)	**MDL**	**Analyzed**	**Analyst**
Benzene	Not detected	1.0	10/20/99	DG
Toluene	Not detected	1.0	10/20/99	DG
Ethylbenzene	Not detected	1.0	10/20/99	DG
m,p-Xylenes	Not detected	2.0	10/20/99	DG
o-Xylene	Not detected	1.0	10/20/99	DG
Naphthalene	Not detected	1.0	10/20/99	DG
1,2,4-Trimethylbenzene	Not detected	1.0	10/20/99	DG
1,3,5-Trimethylbenzene	Not detected	1.0	10/20/99	DG
Methyl-t-butyl ether	Not detected	1.0	10/20/99	DG
Bromofluorobenzene (%SR)	94		10/20/99	DG

SPECTRUM ANALYTICAL, INC.

Laboratory Report

Client ID: **DUP**
Lab ID No: **AB59962**

Location: **Whitingham Country Store-VT**
Client Job No: **40170.10**

Matrix: **Ground Water**
Sampled on10/06/99 Client ECS
Received on 10/07/99 by KC
QC and Data Review by DDR

Preservative: Refrigeration, HCl
Container: 2 VOA Vials
Condition of Sample as Received: Satisfactory
Delivered by: Courier

Volatile Organics

SW846 Method 8021B

Parameter for AB59962	Result (in ug/L)	MDL	Analyzed	Analyst
Benzene	19	5.0	10/19/99	DG
Toluene	31	5.0	10/19/99	DG
Ethylbenzene	59	5.0	10/19/99	DG
m,p-Xylenes	180	10.0	10/19/99	DG
o-Xylene	66	5.0	10/19/99	DG
Naphthalene	25	5.0	10/19/99	DG
1,2,4-Trimethylbenzene	100	5.0	10/19/99	DG
1,3,5-Trimethylbenzene	35	5.0	10/19/99	DG
Methyl-t-butyl ether	290	5.0	10/19/99	DG
Bromofluorobenzene (%SR)	110		10/19/99	DG

SPECTRUM ANALYTICAL, INC.

Laboratory Report

Client ID: **TRIP**
Lab ID No: **AB59963**

Location: **Whitingham Country Store-VT**
Client Job No: **40170.10**

Matrix: **Deionized Water**
Sampled on10/06/99 Client ECS
Received on 10/07/99 by KC
QC and Data Review by DDR

Preservative: Refrigeration, HCl
Container: 2 VOA Vials
Condition of Sample as Received: Satisfactory
Delivered by: Courier

Volatile Organics

SW846 Method 8021B

Parameter for AB59963	**Result** (in ug/L)	**MDL**	**Analyzed**	**Analyst**
Benzene	Not detected	1.0	10/19/99	DG
Toluene	Not detected	1.0	10/19/99	DG
Ethylbenzene	Not detected	1.0	10/19/99	DG
m,p-Xylenes	Not detected	2.0	10/19/99	DG
o-Xylene	Not detected	1.0	10/19/99	DG
Naphthalene	Not detected	1.0	10/19/99	DG
1,2,4-Trimethylbenzene	Not detected	1.0	10/19/99	DG
1,3,5-Trimethylbenzene	Not detected	1.0	10/19/99	DG
Methyl-t-butyl ether	Not detected	1.0	10/19/99	DG
Bromofluorobenzene (%SR)	114		10/19/99	DG

1013 1319

CHAIN OF CUSTODY RECORD

SPECTRUM ANALYTICAL

Page 1 of 1

Special Handling:
- ☒ Standard TAT - 7 to 10 business days
- ☐ Rush TAT - Date Needed: _____
- All TATs subject to laboratory approval; min. 24 hour notification needed for rushes.
- Samples disposed of after 60 days unless otherwised instructed.

Report To: ECS - VT

Invoice To: ECS - MA

Project No.: 40170.10

Site Name: Whitingham Country Store

Location: Whitingham State: VT

Project Mgr.: D. Balk

P.O. No.: _____ RQN: 2727

Sampler(s): JC

1=4°C 2=HCl 3=H_2SO_4 4=HNO_3 5=NaOH 6=MeOH 7=_____

DW=Drinking Water GW=Ground Water WW=Waste Water
SO=Soil SL=Sludge O=Oil X1=$Bill_2O$ X2=_____

G=Grab C=Composite

Lab Id:	Sample Id:	Date:	Time:	Type	Matrix	Preservative	pH	Containers: # Of VOA Vials	# Of Amber Glass	# Of Clear Glass	# Of Plastic	Analyses: 8021B	8015M TPH	Notes:
AB 59957	ECS-1	10/6/99	9:21	6	GW	12		2				1		
AB 59958	ECS-2		9:22	6	GW	12		2				1		
AB 59959	ECS-3		9:24	6	GW	12		2				1		
AB 59960	ECS-4		9:26	6	GW	12		2				1		
AB 59961	DW		9:28	6	DW	12		2	1			1	1	
AB 59962	DUP		—	6	GW	12		2				1		
AB 59963	Trip		—	6	X1	12		1				1		
AB														
AB														
AB														

Additional Instructions:
VT VOC Scan

☐ Fax results when available to (____) _____

Relinquished By:	Received By:	Date:	Time:
Sue Gilmore	C. Henning	10/7/99	11:30
C. Henning	[illegible]	10/7/99	16:40

Spectrum Analytical, Inc.
Laboratory Report Supplement

References

Methods for the Determination of Organic Compounds in Drinking Water. EPA-600/4-88/039. EMSL 1988.

Methods for Chemical Analysis of Water and Wastes. EPA 600/4-79-020. EMSL 1983.

Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater. EPA 600/4-82-057. EMSL 1982.

Test Methods for Evaluating Solid Waste. Physical/Chemical Methods. EPA SW-846. 1986.

Standard Methods for the Examination of Water and Wastes. APHA-AWWA-WPCF. 19th Edition. 1995.

Standard Methods for Comparison of Waterborne Petroleum Oils by Gas Chromatography. ASTM D 3328. 1982.

Oil Spill Identification System. U.S. Coast Guard CG-D-52-77. 1977.

Handbook for Analytical Quality Control in Water and Wastewater Laboratories. EPA 600/4-79-019. EMSL 1979.

Choosing Cost-Effective QA/QC (Quality Assurance/Quality Control) Programs for Chemical Analyses. EPA 600/4-85/056. EMSL 1985.

Report Notations

Not Detected, Not Det, ND or nd	=	*The compound was not detected at a concentration equal to or above the established method detection limit.*	
NC	=	*Not Calculated*	
MCL	=	*EPA Maximum Contamination Level*	
VOA	=	*Volatile Organic Analysis*	
BFB	=	*4-Bromofluorobenzene*	*(An EPA 624 Surrogate)*
p-DFB	=	*1,4-Difluorobenzene*	*(An EPA 624 Surrogate)*
CLB-d5	=	*Chlorobenzene-d5*	*(An EPA 624 Surrogate)*
BCP	=	*2-Bromo-1-chloropropane*	*(An EPA 601 Surrogate)*
TFT	=	*a,a,a-Trifluorotoluene*	*(An EPA 602 Surrogate)*
Decachlorobiphenyl	=	*(an EPA 608/8080 Surrogate)*	

Definitions

Surrogate Recovery = The recovery (expressed as a percent) of a non-method analyte (see surrogates listed above) added to the sample for the purpose of monitoring system performance.

Matrix Spike Recovery = The recovery (expressed as a percent) of method analytes added to the sample for the purpose of determining any effect of sample composition on analyte recovery.

Laboratory Replicate = Two sample aliquots taken in the analytical laboratory and analyzed separately with identical procedures. Analyses of laboratory duplicates give a measure of the precision associated with laboratory procedures, but not with sample collection, preservation, or storage procedures.

Field Duplicate = Two separate samples collected at the same time and place under identical circumstances and treated exactly the same throughout field and laboratory procedures. Analysis of Field duplicates give a measure of the precision associated with sample collection, preservation and storage, as well as with laboratory procedures.

Relative Percent Difference (% RPD) = The precision measurement obtained on duplicate/replicate analyses. %RPD is calculated as:

$$\%RPD = \frac{(value1 - value2)}{ave.\ value} * 100\%$$